

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* FLORIBERTUS C.H. MOKVELD  
and JEAN H.M. BEUGELS

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Appeal 2006-2652  
Application 09/842,373  
Technology Center 1700

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Decided: January 31, 2007

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Before EDWARD C. KIMLIN, THOMAS A. WALTZ,  
LINDA M. GAUDETTE, *Administrative Patent Judges*.  
KIMLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 11-14 and 16-24.

Claim 14 is illustrative:

14. Shaped article containing two or more fiber layers compressed on top of one another, containing highly oriented polyethylene fibers having a modulus of tension of at least 800 g/den and a tensile strength of at least 30 g/den, and at most 30 wt.% of a matrix material, relative to the total weight of the fiber layer, the fibers in the fiber layers being unidirectionally oriented and at an angle relative to the fibers in neighbouring fiber layers,

said fibers having an intrinsic viscosity of at least 5 dl/g, and a fineness of less than 5 denier per filament and 0.05 to 5 wt.% of a non-volatile solvent, said shaped article having a specific energy absorption on impact of an AK47 MSC point of at least 115 J/kg/m<sup>2</sup>.

The Examiner and Appellants rely upon the following references as evidence of obviousness:

Nanri	JP 60151311A	Aug. 9, 1985
Hogenboom	US 5,035,111	Jul. 30, 1991
Dischler	US 5,225,241	Jul. 6, 1993
Van der loo	WO 97/00766	Jan. 9, 1997

*5 Ballistic Materials and Penetration Mechanics* 75, 81, 88 (Roy C. Laible ed., Elsevier Scientific Publishing Co. 1980)

Appellants' claimed invention is directed to a shaped article comprising two or more fiber layers that are compressed on top of another which exhibits the claimed specific energy absorption (SEA). The shaped article comprises highly oriented polyethylene fibers and a non-volatile solvent. According to Appellants, "the high SEA values of the antiballistic shaped articles according to the invention is[sic, are] surprising since the solvent has no antiballistic effect, *per se*, but does contribute to increasing the areal density which would have been expected to lower SEA values" (Br. 3, last paragraph). The shaped article has utility for use in helmets, inserts in bullet-proof vests, military vehicles, etc.

Appealed claims 11-14 and 16-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Van der loo in view of Nanri.

We have thoroughly reviewed the respective positions advanced by Appellants and the Examiner. In so doing, we find ourselves in agreement

with Appellants that the Examiner has failed to establish a prima facie case of obviousness for the claimed subject matter. Accordingly, we will not sustain the Examiner's rejection.

As acknowledged by Appellants and the Examiner, Van der loo discloses a shaped article that is ballistic-resistant much like the claimed shaped article with the exception of not disclosing the inclusion of a solvent. The Examiner cites Nanri for teaching that polyethylene yarn comprising a solvent content within the claimed range has improved properties, such as frictional resistance and wear resistance. Therefore, the Examiner concludes that it would have been obvious to employ the solvent-containing fiber composition of Nanri in the shaped article of Van der loo for the purpose of achieving reduced frictional resistance and wear resistance.

The fatal flaw in the Examiner's reasoning is that it was known in the art that the ballistic resistance of articles made from synthetic fibers is decreased when frictional resistance is decreased. As set forth by Appellants, Van der loo expressly teaches that the solvent is evaporated and removed when making the polyethylene fibers, and references cited at pages 7 and 8 of Appellants' Brief provide substantial evidence that one of ordinary skill in the art would not have considered incorporating a solvent into fibrous layers that are meant to be ballistic-resistant. For example, Appellants cite the Laible article that teaches that the ballistic resistance of the article is reduced due to the slipperiness of the fabric resulting from residual spinning oils, and that the ballistic resistance of polypropylene is

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lower than that of nylon possibly because of the low yarn-to-yarn friction exhibited by polyolefin base fibers. Also, U.S. 5,035,111 [Hogenboom] discusses that the good gliding action of filaments having a low coefficient of friction makes it relatively easy for an impacting bullet to move these filaments apart.

Consequently, since Nanri is not directed to ballistic-resistant clothing or articles, we fully concur with Appellants that one of ordinary skill in the art would not have been motivated by Nanri to include a solvent in the fabric composition of Van der loo.

Also, even if the Examiner had established a prima facie case of obviousness, the Examiner's Answer contains the reversible error of not addressing the evidence of unexpected results discussed at page 13 of Appellants' Brief.

In conclusion, based on the foregoing, we are constrained to reverse the Examiner's rejection.

REVERSED

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Mayer, Brown, Rowe & Maw LLP  
1909 K Street, N.W.  
Washington, DC 20006